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# State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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July 19, 2001

TO: [redacted]

FROM: Wayne H. Western, Team Lead WHW

RE: Response to the Midterm Review, Lodestar Energy Inc., Horizon Mine [redacted] MT99-4

**SUMMARY:**


In accordance with R645-303-211, the Division conducts a midterm reviews for each active permit.. The midterm review for the Horizon Mine began March 23, 1999. Because of overlapping problems with enforcement with Division Order 99B, the midterm review was put on hold for nearly a year. The Midterm Review for the Horizon Mine resumed when Lodestar Energy, Inc. submitted a response to midterm deficiencies on April 25, 2000. The midterm was reviewed and found deficient. The permittee submitted a revised midterm response on January 12, 2001, that was found deficient. On June 19, 2001 the Permittee again submitted a revised midterm response. This TA evaluates the June 19, 2001 response.


**TECHNICAL ANALYSIS:**

# OPERATION PLAN

## SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

**Analysis:**

**Coal Mine Waste**

Coal mine waste is defined as coal processing waste and underground development waste. The Permittee committed not to process coal within the permit area, therefore no coal processing waste will be generated at the site. The Permittee committed in Section 3.3.3.6 Coal Mine Waste of the MRP to

dispose of all underground development waste in underground disposal facilities without bringing the material to the surface.

The Permittee committed that get Division approval before bring the coal mine waste to the surface. The commitment was contingency plan in case mining condition are different than expected.

Some coal mine waste from preSMCRA operations is located on site. The coal mine waste is buried on site and will be exposed and buried during reclamation activities. See the backfilling and regrading section of the TA for more details about how coal mine waste will be handled during reclamation.

**Excess Spoil**

The Permittee states, in Section 3.3.3.6 Coal Mine Waste of the MRP that excess spoil will not be generated in the permit area. Excess spoil is generally associated with surface mines and should not be encountered at the Horizon Mine.

**Findings:**

The information provided meets the minimum regulatory requirements of this section.

## MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

**Analysis:**

**Affected Area Maps**

The boundaries of the disturbed area, as well as those of its component areas of previous and proposed disturbance, are shown adequately on Plates 3-1, 3-6, and 3-7. The permit boundaries are shown on Plate 3-3.

**Mining Facilities Maps**

The locations and approximate dimensions of all mine facilities are shown on Plate 3-1--Surface Facilities. Included on this map are all buildings, portals, fans and earthen structures (pads, cuts and embankments), both of the large main drainage bypass culverts, the mine supply substation adjacent to the main portals, the large main substation at the mouth of the canyon, the Main Haul Road, the Hiawatha Fan Portal Access Road, the conveyor from the mine, the coal storage and loading facilities, the topsoil storage area and the sediment pond. This plate was certified in 1996, after its latest revision, by Richard B. White, a professional engineer registered in the state of Utah.

Design details of the sediment pond are shown on Plate 7-6--Sedimentation Pond Detail Map. This plate was certified in 1996 by Richard B. White, a professional engineer registered in the state of Utah.

**Mine Workings Maps**

The location and extent of all known underground mine workings, including mine openings to the surface within the proposed permit and adjacent areas, are shown on Plate 3-3--Five Year Mine Plan. Other mines in the area include the Sweet Mine, National Coal Co. Mine No. 1 and Beaver Creek Coal Co. No. 3 Mine, which are closed. No surface mining are located within the permit and adjacent areas.

**Monitoring and Sample Location Maps**

Both geologic and groundwater information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Information on water quality and quantity was obtained from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Water Monitoring Locations.

**Findings:**

The information provided meets the minimum regulatory requirements of this section.

# RECLAMATION PLAN

## APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

**Analysis:**

The minimum regulatory requirements for AOC are couched in terms of the backfilling and grading regulations. In addition to the backfilling and grading regulations the Division relies heavy on Technical Directive 004, Approximate Original Contour Requirements, to determine if the reclamation plan adequately addresses AOC. The mining and reclamation plan must provide the basis for determining whether the proposed backfilling and grading plan will meet the following: (1) minimize off-site effects; (2) achieve a final surface configuration that closely resembles the general surface configuration to the land before mining; (3) provide a subsurface foundation for a vegetative cover capable of stabilizing the surface from erosion and (4) support the postmining land use. Each of these requirements is explained as follows:

- *Off-site effects requirements include the following:*

  - *Drainage Restoration:* The final surface configuration shall blend into and complement the drainage pattern of the surrounding terrain. Surface coal mining operations will be planned and conducted to minimize changes to the prevailing hydrologic balance in both the permit and the adjacent areas. The plan for final surface configuration of the affected area shall approximate the drainage pattern for the land prior to mining.

  - *Sediment Control:* The stability of planned postmining slopes should rely on research-based formulas such as the Universal Soil Loss Equations (USLE) or other methods acceptable to the Division. The published values for the factors in the USLE are not site specific. Substitute values should be used when such values have been documented in the mining and reclamation plan and have been suitably justified.

- *The final surface configuration requirements include the following:*

  - *Final Topography*: The postmining topography shall closely resemble the premining topography of the mine site and surrounding area.

    Senate Report No. 28 on Senate Bill S.7 in 1974 shows a legislative intent not to require that the premining topography be identical to postmining topography by stating:

    *It must be emphasized that the requirement to return to approximate original contour does not necessarily mandate the attainment of original elevation. (emphasis added, Senate Report No. 28, 94th Congress, 1st Session, ar 214 (1974).)*

    Elevation should be considered as a factor in evaluation of compliance with this requirement only when a deviation between premining and postmining elevations would result in an adverse effect on one of the reclamation performance standards. The main criteria for compliance with this regulation will be, "Does the postmining topography, excluding elevation, closely resemble its premining configuration?".

    It is preferred to allow a higher postmining elevation on reclaimed areas, rather than have the permittee create permanent out-of-pit storage areas, if slope length and gradient on the reclaimed slopes can be kept within acceptable limits. Similarly for underground mining operations, but on a different scale, mass balance calculations and accurate pre- and post-mining contour maps must be provided in order to determine spoil availability and the final location and disposition of these materials.

    The final grade of post-mining slopes shall not exceed approximate pre-mining slope grades. The Division will take into consideration soil, climate and other pertinent characteristics of the surrounding area in evaluating the adequacy of final graded slopes.

    In arid or semi-arid areas, vegetation alone may not adequately control erosion on steep

slopes. Therefore, the Division will closely evaluate the slope gradients of reclaimed areas to ensure effective erosion control.

- *Eliminate All Spoil Piles:* Elimination of all spoil piles means the regrading and reshaping of spoil materials, as defined in the regulations, in such a manner as to achieve AOC and the requirements of the postmining land use. Refuse materials accumulated at the mine site during mining operations include mine development waste, coal mine waste, coal processing waste, sediment pond waste and any other non-spoil material, and must be placed in accordance with approved designs.

- *Elimination of All Highwalls:* Although highwall retention under some circumstances may provide certain environmental benefits, both federal and state laws require complete elimination of all highwalls. In Utah, the rules indicate that permittees must eliminate all highwalls, except in previously or continuously mined areas and when cliffs existed in the highwall area before mining. Under the general requirements and within the meaning of this directive, elimination of highwalls means backfilling, regrading and reshaping highwalls in a manner that meets AOC requirements and the requirements of the postmining land use.

  The term highwall was initially defined as a feature of surface coal mining operations. Under the regulations the definition also applies to underground coal mining operations. For underground coal mining operations highwall means the area for entry to underground coal mining activities. Portal face-up areas, dugways, shafts and boreholes for entry into underground coal mining activities are all considered highwalls.

  The term highwall has also been broadly interpreted to include cut slopes or cut features associated with highwalls, roads, pad facilities and other surface features related to underground coal mining. The permanent program rules have eliminated this broad interpretation of the term. The rules fail, however, to address what specialized grading techniques, if any, should be used to reclaim cut-slopes or roads and pads.

- *Vegetative Erosion Control:* The site must have a subsurface foundation for a vegetative cover capable of stabilizing the surface from erosion. The Division considers that the vegetation requirements for AOC have been met if the revegetation plan has been approved.

- *Postmining Land Use:* The general postmining land use requirements that are associated with AOC are that the site be returned to the premining land use or restored to an alternative postmining land use. Details for those requirements are as follows:

  - *Premining Land Use:* The premining land uses are those uses which the land previously supported prior to any mining activities and which would have continued if the land had been properly managed. The postmining land use is compared to the premining use. For land that has been previously mined or continuously mined and not reclaimed, the premining land use will be considered to be the land use that existed prior to the initial mining activity.

  - *Alternate Postmining Land Use:* Higher or better uses may be approved as alternate

postmining land uses after consultation with the landowner or the land management agency having jurisdiction over the lands. The proposed uses must meet the following criteria: 1) there is a reasonable likelihood for achievement of the use; 2) the use does not present any actual or probable hazard to public health and safety, or threat of water diminution or pollution; 3) the use will not be impractical or unreasonable, inconsistent with applicable land use policies or plans, involve unreasonable delay in implementation, or cause or contribute to violation of Federal, State, or local law.

The Division evaluated the reclamation plan for the Horizon Mine for compliance with each of the four parts of the AOC requirements. Three of the parts of the AOC requirements (hydrology, vegetation and postmining land use) do not have specific regulations in those sections of the R645 rules. Therefore, the Division considers those requirements to be met when the requirements for hydrology, vegetation and postmining land use have been met. Those requirements are be addressed in their specific sections of the TA.

The requirements that will be discussed in the AOC section of the TA involve surface configuration. The discussion of those requirements is as follows:

- *Final Topography*:

The Permittee states in Section 3.5.4, subsection Approximate Original Contour of the submittal the following about restoring the site to the approximate original contours:

*The area of the Horizon surface facilities was disturbed by previous mining activities. No pre-mining topographic maps of the area are known to exist. The reclamation plan has been designed to backfill and grade the site to achieve the assumed approximate original contour (i.e., to blend into the surrounding topography) and eliminate highwalls associated with the Horizon Mine.*

The Horizon Mine is in a steep narrow canyon. The permittee has limited options for reclaiming the site because of the surrounding steep slopes. Some reclaimed slope will have 1.5 H to 1 V grades. However, none of the reclaimed slopes will exceed the slope angle of of surface in the surrounding area.

Plate 3-7 shows the reclamation contours. The reclaimed slopes will feather into the existing slopes. The drainages has been established so that they are similar to those in adjacent canyons. The cross sections on Plate 3-7A shows the existing (operational) grades and the proposed reclamation grade. The cross sections show that the reclaimed area will be a "V" shaped valley that is similar to those of the surrounding area. The Division finds that the reclaimed surface will be similar to what most likely was the premining surface.

- *Eliminate All Spoil Piles:*

No spoil piles are scheduled to be constructed on site. If the Permittee must develop spoil piles

then they will have to receive Division approval to modify the MRP.

- *Elimination of All Highwalls:*

During construction of the portals three highwalls were created and then backfilled. A description of the highwalls is as follows:

- The return air portal was developed at one of the old Blue Blaze No. 1 Mine portals. The mine opening was widened to accommodate modern mining equipment. A 50 foot concrete portal cover was then constructed from the mouth of the old slope. Fill material was placed over the concrete cover which covered the highwall.
- The belt portal was excavated a length of 95 feet to solid overburden where the slope could be driven down to the seam. A 95 foot concrete portal cover was constructed for the belt portal. Fill material was placed over the concrete cover which covered the highwall.
- The intake portal was constructed for the intake slope. A 125 foot concrete portal cover was constructed for the intake portal. Fill material was placed over the concrete cover which covered the highwall.

The Permittee stated in section 3.5.4 Backfilling and Grading Plan subsection Elimination of Highwalls, Spoil Piles, and Depressions that no highwalls exist in the disturbed area. The Division accepts that statement with some clarification which is that highwalls were created during the construction of the portals. However, the highwalls were then backfilled and eliminated during construction. Figure 3-6, Horizon Portal Sealing, shows that backfill was placed against the highwalls and that the highwalls will remain covered after reclamation. The Division finds that the reclaimed site will conform with the final surface configuration requirements of the AOC directive.

**Findings:**

The Permittee has met the AOC minimum regulatory requirements.

## BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

**Analysis:**

A slope stability study was done for the proposed reclaimed slopes at the Horizon Mine. The Permittee used SBSlope, a slope stability program, to calculate the safety factors for the slopes. The results of the slope stability study indicate safety factors for slope J-J' and slope S-S' are 1.9 and 1.5 respectively. Those slopes were chosen because they are the longest or steepest reclaimed slopes. The minimum safety factor for reclaimed slopes is 1.3. Therefore, the Permittee has met that requirement.

The Permittee states that no coal seams are currently exposed in the disturbed area. However,

if any coal seams were exposed during backfilling and regrading then the coal seams would be covered with 4 feet of nontoxic and noncombustible materials. In subsection Elimination of Highwalls, Spoil Piles and Depressions the permittee states that access to the coal seam are by means of shallow angle slopes that drop 6 feet to 12 feet before intercepting the coal seams.

The acid- and toxic- forming materials that have been identified in the disturbed area are buried waste materials (coal mine waste) from previous mining operations. See Plate 3-7.

Section 3.3.2.5 of the existing MRP discusses the coal mine waste buried within the operations pad. The existing MRP indicates that approximately 2500 - 2700 CY of waste are buried 4 feet deep within the pad. This information is restated in the submittal, page 3-44, under "Acid and Toxic Forming Materials." The plate in Appendix 3-8 is entitled Sweets Canyon, Pond Utilities. It did not have the information mentioned on coal mine waste burial locations.

On Plate 3-7 the location of buried coal mine waste is shown to be in or near the Portal Canyon drainage. drainage burial locations are indicated on the recently submitted Plate 3-7, Reclamation Topography. This map shows coal mine waste buried very close to the drainage of Portal Canyon. And, it appears from this map and Plate 3-7A, Post Mining Cross-Sections, that the grading operations in areas G-G', H-H' and J-J' will uncover coal mine waste. The permittee needs to show the location of the coal mine waste on Plate 3-7A so that the Division can determine if the coal mine waste will be uncovered during reclamation.

R645-301-746.120 requires that all coal mine waste be placed in a manner to minimize adverse effects of leachate and surface water runoff. Plate 3-7 shows that all coal mine waste will be placed outside of the drainages.

The Permittee does not propose to leave any cut and fill terraces. Nor do they propose to leave any settled and revegetated fills.

The highwall issues are cover in the AOC section of this TA.

**Findings:**

The Permittee has met the backfilling and grading minimum regulatory requirements.

**RECOMMENDATIONS:**

The Division should approve the submittal.

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